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10/024,775	12/19/2001	Peter J. Janssen	US010551	3937

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EXAMINER

CURTIS, CRAIG

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 07/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/024,775

Applicant(s)

JANSSEN, PETER J.

Examiner

Craig H. Curtis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 2B in Fig. 3 should be changed to 28; and h1 & h2 in Fig. 4A are not mentioned in the description. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Moreover, Figures 2A & 2B should each be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. **These objections to the drawings will not be held in abeyance.**

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

More specifically with respect to claims 1-6, the meaning of the limitation "...confining said P and S components by Total Internal Reflection (TIR) [read: total internal reflection (TIR)] in said polarizing

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beam splitter and said prism, respectively." recited in claim 1 appears to be misdescriptive, in that both said P and S components exit, respectively, said polarizing beam splitter and said prism, and cannot therefore be considered as being confined in either of these elements. And with regard to claims 7-11, the meaning of the limitation "...confining said P and S component light beams by Total Internal Reflections (TIR) [read: total internal reflections (TIR)], respectively." cannot be ascertained, in that, as presently recited, one can ascertain neither the manner nor to what extent said P and S component light beams are "confined" by total internal reflection. It is respectfully suggested that Applicant (1) consider using the phrasal *totally internally reflecting* in lieu of the presently recited *confining* phrase and (2) unambiguously identify where--i.e., in which particular elements--such total internal reflection occurs.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4, 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Applicant's Admitted Prior Art (Figs. 1A, 2A, and 2B).

With regard to claim 1, Applicant's Admitted Prior Art discloses the invention as claimed--a method of converting an input beam of non-polarized light (e.g., 10 in Fig. 1A) having a waist of predetermined height and width in a predetermined plane (both inherent) to an output beam of

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polarized light having a geometrical extent increased from that of said input beam by no more than a factor of two (See either of the beams identified by "OUTPUT BEAM S POLARIZED" in Fig. 1A; in either instance, said factor being one), said method comprising:

a) positioning a polarizing beam splitter with an input surface having a height and width equal to a predetermined height and width in a predetermined plane, thereby dividing said input beam into perpendicular P and S polarized components (N.B., polarization beam splitter being identified in the specification as interface (read: polarization beam splitter) 14, not as prism elements whose hypotenuses abut polarization beam splitter 14);

b) passing said P component light beam through a $\frac{1}{2}$ wave retarder, whereby the light beam exiting said $\frac{1}{2}$ wave retarder has the same polarization as said S component light beam (See Fig. 1A);

c) positioning a turning prism (right angle prism whose hypotenuse is 16) in the path of said S component light beam to direct said S component light beam passed therethrough parallel to and laterally adjacent said P component light beam exiting said $\frac{1}{2}$ wave retarder, said P and S component light beams exiting said $\frac{1}{2}$ wave retarder and said prism jointly[,] forming an output beam having a geometrical extent exceeding that of said input beam by a factor of substantially two (See Fig. 1A) ; and

d) confining said P and S components by total internal reflection (TIR) in said polarizing beam splitter and said prism, respectively (in an identical manner to that exhibited by the method of the instant invention).

With regard to claim 4, please see Page 1, lines 5-10 of the specification.

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With regard to claim 5, Applicant's Admitted Prior Art discloses both wherein said waist of input beam is often elliptical (Page 3, lines 29-20 of Specification) and wherein input surface is rectangular. See Prior Art Figs. 1A & 2A.

With regard to claim 6, said turning prism of Applicant's Admitted Prior Art includes parallel side surfaces (see Fig. 1A), and said S component light beam is confined in said turning prism by TIR by said side surfaces (in a manner identical to that which occurs in the method of the instant invention).

With regard to claim 7, Applicant's Admitted Prior Art, as set forth in detail above, encompasses Applicant's non-imaging polarization conversion method teaching. See Fig. 1A and above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art.

Applicants' Admitted Prior Art (Figs. 1 and 2) discloses the invention as claimed EXCEPT FOR explicit teachings of the following additionally recited limitation:

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wherein, with respect to claim 8, said S component light beam passes through a $\frac{1}{2}$ wave retarder, thereby placing said S component light beam in phase (read: have the same polarization as) with said P component light beam.

Applicant's Admitted Prior Art, however, discloses wherein said P component light beam passes through a $\frac{1}{2}$ wave retarder, thereby placing P component light beam in phase with said S component light beam, and it is notoriously old and well-known in the optical polarization art to modify one or the other of orthogonally polarized S- and P-component beams such that both beams have like polarization. For this reason, the Examiner hereby takes Official Notice that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have said S component light beam pass through a $\frac{1}{2}$ wave retarder, thereby placing (read: converting) said S component light beam in phase with said P component light, as opposed to vice versa, for at least the purpose of achieving, as in the opposite case, an output beam having uniform polarization (S or P).

With regard to claim 11, Applicant's Admitted Prior Art teaches wherein said waist is (often) elliptical. See Page 3, lines 29-30 of the Specification.

5. Claims 2, 3, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art in view of Ho et al. (6,512,502).

Applicant's Admitted Prior Art discloses, as set forth above, the invention as claimed EXCEPT FOR explicit teachings of the following additionally recited limitations: wherein, with respect to claims 2

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and 9, said TIR is achieved by providing a first air gap between parallel, opposing surfaces of said polarizing beam splitter and said prism (said second air gap between parallel, opposing surfaces of said polarizing beam splitter and said $\frac{1}{2}$ wave retarder being taught as depicted in Fig. 1A; cf. Figs. 1A & 3 vis-à-vis the depiction of said second air gap between parallel, opposing surfaces of said polarizing beam splitter and said $\frac{1}{2}$ wave retarder); and, with respect to claim 3, TIR is achieved by providing a first layer of low refractive index optical cement between opposing surfaces of said polarizing beam splitter and said prism, and a second layer of low refractive index optical cement between opposing surfaces of said polarizing beam splitter and said $\frac{1}{2}$ wave retarder.

Ho et al., however, disclose, with respect to claims 2 and 9, a method wherein TIR is achieved by providing a first air gap between parallel, opposing surfaces of a beam splitter (300b) and a prism (300c). See Fig. 8; also see col. 7, ll. 1-9. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method teachings of Applicant's Admitted Prior Art so as to provide a first air gap between parallel, opposing surfaces of said polarizing beam splitter and said prism, such teaching being rendered obvious in light of the above-described disclosure by Ho et al., for at least the purpose of ensuring TIR take place in a predictable, reliable manner. And with respect to claims 3 and 10, Ho et al.'s wherein TIR is achieved by providing an air gap between parallel, opposing surfaces of a beam splitter and a prism renders obvious Applicant's limitation wherein, instead of an air gap (air being a low index medium relative to said beam splitter and prism), a low refractive index optical cement is provided between opposing surfaces of said polarization beam splitter and said

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prism. That is, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method teachings of Applicant's Admitted Prior Art such that low refractive index optical cement be provided between opposing surfaces of said polarization beam splitter and said prism, such of providing low refractive index optical cement between optical elements being notoriously old and well-known in the optical art, for at least the purpose of ensuring both that TIR take place and that unwanted dust not collect between said elements. It is noted that the provisioning of a second layer of low refractive index optical cement between opposing surfaces of said polarizing beam splitter and said $\frac{1}{2}$ wave retarder in lieu of the air gap already taught between surfaces of said polarizing beam splitter and said $\frac{1}{2}$ wave retarder would have been obvious to one having ordinary skill in the art at the time the invention was made for the same reasons as set forth above with regard to the obviousness of substituting low refractive index optical cement for the air gap present between opposing surfaces of said polarizing beam splitter and said prism.

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Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig Curtis, whose telephone number is (703) 305-0776. The facsimile phone number for Art Unit 2872 is (703) 308-7722.

Any inquiry of a general nature regarding the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0956.



Audrey Chang
Primary Examiner
Technology Center 2800



Craig H. Curtis
Group Art Unit 2872
26 June 2003